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09/535,696	03/27/2000	Scott Arthur Jones	10001011-1	4175

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EXAMINER	
PHAN, MAN U	
ART UNIT	**PAPER NUMBER**
2665	

DATE MAILED: 08/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)
09/535,696	Jones et al.
Examiner	**Art Unit**
Man Phan	2665

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *Jun 11, 2003*

2a) ☒ This action is **FINAL.** 2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideratio

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-18* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examine

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____
4) ☐ Interview Summary (PTO-413) Paper No(s). _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

Response to Amendment and argument

1. This communication is in response to applicant's 06/11/2003 Amendment in the application of Jones et al. for a "Method and system for transmitting data between a receiver and a transmitter" filed 03/27/2000. The amendment to the claims has been entered and made of record. Applicant's arguments to the pending claims have been considered but are not persuasive, and will be examined as discussed below. Claims 1-18 are pending in the application

Claim Rejections Removed - 35 U.S.C. § 112

2. The rejections of record with respect to claim 12 under 35 U.S.C. § 112, second paragraph, are hereby removed based on applicant's amendment.

3. Applicant's amendment and argument to the rejected claims are insufficient to distinguish the claimed invention from the cited prior arts or overcome the rejection of said claims under 35 U.S.C.§ 102 & 103 as discussed below. Applicants' argument with respect to the rejected claims have been fully considered, but they are not persuasive for at least the following reasons.

4. Applicant's argument with respect to the amended claims 1, 16 and 17 (page 7, last paragraph) that the cited references do not disclose or suggest the functionality of the

receiver in the claims. However, Ben-Num et al. (US#5,633,867) is applied herein merely for the teaching of a credit-based ATM flow control mechanism for transmitting data between one receiver (118) and one transmitter (102) using the Virtual Channel (VCs) connection (106, 114). ATM uses a concept of virtual networking (or channels) to pass traffic between two locations, establishing virtual connections between a pair of ATM end-systems which are needed to connect a source with a destination. These connections are termed "virtual" to distinguish them from dedicated circuits. ATM cells always traverse the same path from source to destination. However, ATM does not have to reserve the path for one user exclusively. Any time a given user is not occupying a link, another user is free to use it. ATM connections exist only as sets of routing tables held in each network node, switch, or other intermediate system, based on the virtual circuit identifier (VCI) and virtual path identifier (VPI) contained in the cell header. When a virtual path is established, each node (or switch) is provided with a set of lookup tables that identify an incoming cell by header address, route it through the node to the proper output port, and overwrite the incoming VCI/VPI with a new one that the next node along the route will recognize as an entry in its routing table. The cell is thus passed from switch to switch over a prescribed route, but the route is "virtual" since the facility carrying the cell is dedicated to it only while the cell traverses it. Two cells that are ultimately headed for different destinations may be carried, one after the other, over the same physical wire for a common portion of their journey (See Fig. 4; Col. 1, lines 53 plus).

5. Applicant further argue with respect to the functionality of the receiver in that "*the receiver is the entity which controls the transmissionof data and it signals the transmitter that it is available to receive a data packet when it send a credit packet to the transmitter*". However, Ben-Num et al. teaches in Fig. 4 a block diagram illustrated memory management of a credit-based ATM flow control mechanism, in which when the downstream ATM adapter 112 moves the ATM cell 104 of VCI 106 from its local memory 116 from a receiver portion 118 and into a host memory 120, the downstream ATM adapter 112 generates a credit 122 for the transmitter portion 102 of the upstream ATM switch 100 to allow transmission of a new ATM cell (not shown) on VCI 106 *(the receiver sends a credit packet to the transmitter, and it signals the transmitter that it's available to receive a data packet)*. This credit for the transmitter portion 102 can be carried by any ATM cell transmitted by the transmitter portion 110 of the downstream ATM adapter 112 to a receiver portion 124 of the upstream ATM switch 100. For example, in Fig. 4 a credit 126 for VCI 106 is carried on an ATM cell 128 on VCI 114 (Col. 5; lines 11 plus). Applicant further alleges that "*the receiver specifies the unique virtual channel number in as much as the unique virtual channel number is part of the credit packet that is sent by the receiver to the transmitter*". However, It's noted that in the credit-based, per hop, per virtual circuit (VC) flow control. It allows the network links to operate near full capacity without cell loss or instability. ATM credit based flow control requires that a cell not be transmitted on a communication link unless the sender knows that a buffer is available at the receiver to hold the cell. The sender maintains a "credit balance" for each virtual circuit (VC). As cells are sent, the sender decrements the

balance, and refrains from sending a new cell if the balance is zero. When the receiver forwards a cell (thereby freeing a buffer), it transmits to the sender a credit *(the receiver sends a credit packet to the transmitter using assigned VC)*. The sender and receiver in hop by hop flow control are on either side of the communications link (See Fig. 8; Col. 2; lines 21 plus). In credit based flow control, a virtual circuit is first assigned a number of credits which can be outstanding at any time. A credit, when held by a source node gives that source node permission to transmit one cell. When the cell is received by the destination node, the destination node keeps the credit until a buffer in the destination node which has received the cell is cleared of the received cell. After the buffer is cleared, the destination node returns a credit to the source node, thereby giving the source node permission to send another cell on that virtual circuit. ATM networks relay and route traffic by means of a virtual circuit identifier (VCI) and a virtual path identifier (VPI) contained within the cell. Given the teaching from Ben-Num et al. as discussed above, the examiner maintains that the references cited and applied in the last office actions for the rejection of the claims 1-18 are maintained in this office action.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in

the United States.

7. Claims 1-3, 5-6 and 16-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Ben-Num et al. (US#5,633,867).

With respect to claims 1, Ben-Num discloses in Fig. 4 a block diagrams of an exemplary credit-based ATM flow control mechanism according to the essential features of the claims, in which a receiver (112) sending to the transmitter (100) a Virtual Channel credit packet (128) indicating that the receiver (112) is available to receive data. The transmitter (100) and receiver (112) are in communication via a plurality of Virtual Channels (106, 114), each being assigned with a unique VC number. The transmitter responding to the virtual channel credit packet including transmitting a data packet on the assigned unique VC to the receiver if a data packet is available (Col. 5, lines 7 plus and Col. 2, lines 21 plus). Though Ben-Num does not explicitly show the receiver receiving the "another cell" transmitted from the transmitter, the receiver receiving the data implies it receives (Col. 5, lines 27-28).

Regarding claim 2, Ben-Num teaches that the virtual channel credit packet is sent when the receiver has the available resources (*cell will have buffer*) to receive transmission data from the transmitter and is ready to do so *(okay to send)* (Col. 5, lines 8-9).

Regarding claim 3, Ben-Num teaches that the data includes the unique virtual channel number (68, 70) assigned to the particular virtual channel (See Fig. 3; Col. 5, lines 47-49).

Regarding claim 5, Ben-Num teaches of carrying a "credit", indicating the

availability of a buffer in the receiver for a virtual channel (Col. 5, lines 7-10). The credit is stored by "credit return mechanism" that is a FIFO buffer used to store credits to be returned the transmitter, for particular virtual channels (Col. 9, line 48 - Col. 10, line 4). Though Ben-Num does not explicitly show the receiver checking for available buffer for transmission. It is inherent that the receiver does this in order to produce credits to be placed in the "credit return mechanism". Ben-Num further teaches of not returning a credit for a cell received by the receiver and placing it into the stalled queue, where there is a stored variable for recording the number of credits not returned. These credits are then placed in the "credit return mechanism" when they are moved to the active queue (Col. 7, lines 50-63 and Col. 9, lines 59-64), i.e. when the buffer is available , which will then send the virtual channel credit packet for the particular virtual channel once buffer is available (Col. 9, lines 65-66 and Col. 5, lines 53-58). Therefore, when the buffer is not available (stalled queue), the receiver waits a predetermined time, which is the time until the VC is moved to the active queue.

Regarding claim 6, It's inherent in the design that the receiver repeating the step of checking for available buffer until a buffer is available because the system disclosed by Ben-Num returns the credits to the transmitter after they have been moved to the active queue (Col. 7, lines 61-63 and Col. 9, lines 59-61). Therefore, a process of checking for this event must occur and be repeated so that credits can be returned.

With respect to claim 16, Ben-Num discloses in Fig. 4 a block diagrams of an exemplary credit-based ATM flow control mechanism according to the essential features of the claims, in which a receiver (112) sending to the transmitter (100) a Virtual Channel

credit packet (128) indicating that the receiver (112) is available to receive data. The transmitter (100) and receiver (112) are in communication via a plurality of Virtual Channels (106, 114), each being assigned with a unique VC number. Ben-Num further teaches of a means for sending a virtual channel credit packet (128) for a particular channel to the transmitter (100) (Col. 5, lines 11-23 and 46-50). Ben-Num further teaches that the credit packet being indicative that the receiver is available to receive data (Col. 5, lines 7-10); means for responding to the virtual credit packet and transmitting a data packet to the credit packet sending means (another cell of VCI 106) (Col. 5, lines 27-28); means for accepting (118) the data packet from the data packet transmitting means (102); the virtual channel credit packet (ATM cell 128) (Fig. 4; Col. 5, lines 24-28) having a unique virtual channel number (68, 70) assigned to the particular virtual channel (See Fig. 3; Col. 5, line 47-49).

Regarding claim 17, Ben-Num discloses in Fig. 4 a block diagrams of an exemplary credit-based ATM flow control mechanism according to the essential features of the claims, in which a receiver (112) sending to the transmitter (100) a Virtual Channel credit packet (128) indicating that the receiver (112) is available to receive data. The transmitter (100) and receiver (112) are in communication via a plurality of Virtual Channels (106, 114), each being assigned with a unique VC number (Col 5, lines 11-23 and 46-50). Ben-Num further teaches that the credit packet being indicative that the receiver is available to receive data (Col. 5, lines 7-10); a transmitter being adapted to respond to the virtual channel credit packet and transmit a data packet to the receiver (another cell) (Col. 5, lines 27-28); a receiver being adapted to accept the data packet

transmitted from the transmitter; the virtual channel credit packet (ATM cell 128) (Fig. 4; Col. 5, lines 24-28) having a unique virtual channel; number assigned to the particular virtual channel (See Fig. 3; Col. 5, line 47-49).

Regarding claim 18, Ben-Num teaches that the virtual channel credit packet is further indicative of the receiver having an available buffer of sufficient capacity *(cell will have a buffer)* to receive a data packet from the transmitter (*okay to send*) (Col. 5, lines 8-9).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ben-Num et al. (US#5,633,867).

With respect to claims 7, Ben-Num disclose the claimed limitations with the rejection of claim 1 as discussed in paragraph 7 above. Ben-Num et al. fails to explicitly teach of a transmitter checking for an available buffer, waiting a predetermined time if unavailable, and looking for a virtual channel credit packet from the receiver if a buffer is available. Ben-Num further teaches in Fig. 4 an exemplary credit-based ATM flow control mechanism, includes a transmitter portion of a communications link (102) (Col. 5, lines 2-4), and further teaches of the system designed such that there are "credits and buffers per VC" (Col. 4, lines 66-67), therefore there are buffers in the transmitter (102) assigned to a specific VC. Incoming data to a transmit buffer that is occupied would cause data collision if it were to enter before finishing with the previous data, resulting in corruption of data. Prematurely emptying the transmit buffer of its current data to allow incoming data is undesirable as it is what the system discloses by Ben-Num seeks to avoid through transmitting only when given permission through credits (Col. 2; lines 21-34). Therefore, it would have been obvious to check upon the availability of a transmitter buffer, of data incoming on a specific VC before accepting it into the buffer.

Additionally, the process carried out by a transmitter, such as cell transmission and SAR (Col. 3, lines 40-45) require a specific amount of time to be carried out,

therefore an unavailable transmit buffers state would only change after a period of time that would allow these processes to be carried out and the transmit buffer to free up space. It would have been obvious for the transmitter (102) to wait a predetermined time (sufficient for the processes to complete and free space in the buffer before checking again), if the buffer were found unavailable.

Finally, Ben-Num teaches of the transmitter tramnsmitting only when it has a credit on a particular virtual channel, which it receives from the receiver (Col. 5, lines 14-18, 21-23 and 27-28). It would have been obvious for a transmitter with a buffer available to transmit data to look for the recipt of a credit packet, so that the transmit data can be transmitted when detected.

One of ordinary skill in the art would have been motivated to check for available buffers, wait for a predetermined time when unavailable and check for credits when available for a specific VC, so that the transmit buffer can handle incoming data more efficiently and prevent data loss due to buffer congestion while waiting for transmit credits.

Regarding claim 8, Ben-Num disclose the claimed limitations with the rejection of claim 7 as discussed above. Ben-Num et al. fails to explicitly teach of the transmitter waiting further comprising repeating the steps of checking for available buffer. As discussed above, it was obvious for the transmitter to check for an available buffer, and to wait for a predetermined time if unavailable, so that the necessary transmit processes may be performed on the buffers current contents. When the processes are completed and the buffer is made available (*after a predetermined time*), the buffer will be made available to

new data to be transmitted on the VC since the transmitter are operable to transmit data more than once. Therefore, it would have been obvious o repeat the step of checking the buffer so that when it has been detected as available, new data may enter it for transmission. Once of ordinary skill in the art would have have been motivated to do this, so that data can enter the transmit buffer at the same rate that data is transmitted from it, making the transmit process more efficient and preventing congestion.

11. Claims 4 and 9-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ben-Num et al. (US#5,633,867) in view of Bennett (US#5,610,745) .

With respect to claim 9, Ben-Num et al. disclose the claimed limitations with the rejection of claim 7 as discussed in paragraphs 9 & 10 above. Ben-Num further teaches of a "null cell" where the received data does not contain a credit (Col. 5, lines 59-62). According to the system disclosed by Ben-Num, when the transmitter has no credit on the VC (Col. 2, lines 31-32). However, Ben-Num et al. do not disclose expressly wherein the transmitter checking for available data for transmission if the virtual channel credit packet is found.. In the same field of endeavor, Bennett teaches of a similar system employing credit-based flow control using credit counter for tracking the availability of the receive buffer. Fig. 5 shows a flow chart illusrtated of the smart credit method for tracking buffer availability includes checking for available data for transmissionif the virtual channel credit packet is found (Col. 7, lines 23-33).

Regarding claim 10, Bennett further teaches of the transmitter includes repeating the step of of looking for the virtual channel credit packet until the packet is found (See

Fig. 5; Col. 5, lines 23-33). Where frames to transmit is yes, the credit counter is zero and no receiver ready signal has been received. It will repeat steps 510-515-530-510 until a receiver ready signal is received.

Regarding claims 11-12, Bennett further teaches of the transmitter waiting for a predetermined time if no data is available (See Fig. 5; ol. 7, lines 23-33) where the the predetermined time is the time in which the data becomes available (*when the answer to 510 becomes yes)*. Bennett further teaches of the transmitter repeating this process until data becomes available (*answer to 510 becomes yes*), and then sending data if it is available (See Fig. 5; and the steps 510-515-520).

Regarding claims 4 and 13, though Ben-Num et al. fails to explicitly teach of repeating the method according to the claim 1 for the next virtual channel credit number until all virtual channels are running. Ben-Num teaches of the system operating "x" VC's simultaneously (Col. 2, lines 41-44). In order to establish multiple VC's simultaneously, one of ordinary skill in the art would have repeated the method of claim 1 until all available VC were operating. One of ordinary skill in the art would have been motivated to do this, so that multiple connections can be established without permanency, thereby increasing throughput and flexibility of handling bandwidth.

Regarding claims 14-15, thoughBen-Num does not explicitly show the receiver checking if the data has been received from the transmitter and waiting for a predetermined time if data has not been received. In order to receive data over the virtual channels, the receiver must check if it has received any. Furthermore, if it has not received the data, it must wait for a predetermined time. That time being the time until

the data does arrive. Therefore, it's inherent in the design. Ben-Num further fails to explicitly teach of repeating the method according to claim 1 for the next virtual channel credit number. However, Ben-Num teaches of the system operating "x" VC's simultaneously (Col. 2, lines 41-44). In order to establish multiple VC's simultaneously, one of ordinary skill in the art would have repeated the method of claim 1 until all available VC were operating. One of ordinary skill in the art would have been motivated to do this, so that multiple connections can be established without permanency, thereby increasing throughput and flexibility of handling bandwidth.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The Barkey et al. (US#6,044,406) is cited to show the credit-based flow control checking and correction method.

The Ben-Num et al. (US#5,483,526) is cited to show the resynchronization method and apparatus for local memory buffers management for an ATM adapter implementing credit-based flow control.

The Lauer (US#5,528,591) is cited to show the end-to-end credit-based flow control system in a digital communication network.

The Zheng et al. (US#5,432,824) is cited to show the credit/rate-based system for controlling traffic in a digital communication network.

The Zheng et al. (US#5,515,359) is cited to show the credit enhanced proportional rate control system.

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Mphan

08/20/2003

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